CHRISTIE

USER GUIDE

VeinViewer® Flex

020-300020-07 Rev. 1 10-2015

CHAPTER ONE: INTRODUCTION 1

INTENDED USE 1
INDICATIONS FOR USE 1
CONTRAINDICATIONS 1

CHAPTER TWO: WARNINGS AND SAFETY NOTICES 3

SYMBOLS DEFINITIONS 3
GENERAL SAFETY AND WARNINGS 5

CHAPTER THREE: VEINVIEWER FLEX DESCRIPTION 9

PARTS LIST 9
VEINVIEWER FLEX UNIT 10
CONTROL PANEL 11
OPTIONAL ACCESSORIES 12

CHAPTER FOUR: VEINVIEWER FLEX SETUP 13

CHARGING THE BATTERY 13
INSTALLING THE BATTERY 15
REMOVING THE BATTERY 16
ATTACHING THE WRIST STRAP 17
ATTACHING VEINVIEWER FLEX TO S-MOUNT 24

CHAPTER FIVE: START-UP PROCEDURE 27

POWERING VEINVIEWER FLEX 27
POWERING OFF VEINVIEWER FLEX 28

CHAPTER SIX: OPERATING INSTRUCTIONS 29

FOCUSING 29
FOCUSING PROCEDURE 29
IMAGING MODES 31
IMAGING FEATURES 32
IMAGE CAPTURE PROCEDURE 33
PROJECTED IMAGE DISPLAY 34
STATUS INDICATOR 34

SOFTWARE VERSION 35
DROP EVENT 35

CHAPTER SEVEN: LICENSE, SOFTWARE AND FIRMWARE UPGRADE 37

VEINVIEWER FLEX CONNECT SOFTWARE INSTALLATION 37
FLEX CONNECT INSTALLATION 37
CONNECTING VEINVIEWER FLEX TO YOUR PC 38
VEINVIEWER FLEX CONNECT IMAGE MANAGEMENT 38

CHAPTER EIGHT: MAINTENANCE 39

CLEANING 39
VEINVIEWER FLEX DISPOSAL 40

CHAPTER NINE: SERVICE AND SERVICEABILITY 41

SERVICEABLE ITEMS BY USER 42

CHAPTER TEN: TROUBLESHOOTING 43

DROP EVENT 43

CHAPTER ELEVEN: TECHNICAL SPECIFICATIONS 55

VEINVIEWER FLEX TECHNICAL SPECIFICATIONS 55
EQUIPMENT CLASSIFICATION 56

CHAPTER TWELVE: LIMITED WARRANTY 63

NOTES 65

Please carefully read the information in this manual in its entirety and review these materials periodically to ensure that you will be able to use VeinViewer® Flex confidently and correctly.

This manual is a reference for using VeinViewer Flex. It does NOT provide training in venous identification or clinical practices.

This manual covers the setup and use of VeinViewer Flex and includes a table of contents to help you find the information you need. If additional information is needed, contact Christie Medical Holdings at www.veinviewer.com, via e-mail at info@veinviewer.com or call Christie Technical Support toll-free at 1-877-SEE-VEIN (1-877-733-8346). For international calls, dial +01-901-721-0330.

INTENDED USE

VeinViewer Flex is a non-invasive, handheld electro-optical visual aid device designed to detect superficial blood under the skin, and project an image of the blood pattern onto the surface of the skin of neonatal, pediatric, and adult patients.

INDICATIONS FOR USE

VeinViewer Flex is intended to image subcutaneous blood patterns on the surface of the skin. The projected blood patterns may be interpreted by the clinician to determine intravascular or interstitial blood patterns, such as:

- blood within vessels, for example, veins,
- the blood flowing through the vessels, for example, venous refill,
- and/or blood within the interstitial space, for example, hematoma.

The projected image pattern may also be used to demonstrate intravenous (IV) fluids displacing blood during IV flushes.

VeinViewer Flex is intended to be used by trained Health Care Professionals such as, but not limited to, Licensed Doctors, Nurse Practitioners (non-CRNA), Emergency Medical Technicians, Registered Nurses, Anesthesiologists, Vascular Access Technicians, Phlebotomists, Infusion Nurses, to perform vascular access.

CONTRAINDICATIONS

VeinViewer Flex is not intended to be used for imaging of veins in the eyes, in tissue differentiation, as a diagnostic device or as a form of treatment.

VeinViewer Flex is not intended to be used near equipment that may emit strong magnetic fields such as MRI equipment.

VeinViewer Flex is not intended to be used to diagnose or verify the presence of a medical condition. It is not to be used outside or in direct sunlight.

This page has been intentionally left blank.

Observe the safety precautions outlined in this section to obtain maximum personal safety and to protect your VeinViewer Flex.

SYMBOLS DEFINITIONS

Symbols are used in this guide and apply to hazards or unsafe practices which could result in personal injury or property damage. See the information below for definitions of symbols.

WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or loss of life.

CAUTION: Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury or damage.

Provides important recommendations and information for efficient, trouble-free use.

Consult accompanying documentation. **Note:** This symbol is blue on the product.

SN Serial number

Battery

Storage temperature limits

Storage humidity limits

Storage pressure limits

Manufacturer

On/Standby

Date of manufacture (YYYY-MM)

WEEE - Do Not dispose of this product in household waste. This product MUST be disposed of in accordance with local directives as established in the EU for the disposal of electronic equipment.

Keep Dry

Consult operating instructions

EC REP European representative

Fragile - Handle With Care

This End Up

Class IIa device complies with European Directive 93/42/EEC

Canadian Standards Association mark.

GENERAL SAFETY AND WARNINGS

This safety section contains important information for the safe operation and use of this product.

WARNING: DO NOT use this product or any available optional equipment without first completely reading and understanding the instructions outlined in this manual and any additional instructional material such as service manuals or instruction sheets supplied with this product or optional equipment.

If you are unable to understand the warnings, cautions or instructions within this manual, contact Christie Technical Support before attempting to use this equipment. Failure to do so could result in injury or damage.

WARNING: DO NOT make any modifications to this equipment beyond the instructions provided in this manual or instruction sheets supplied with this product or optional equipment. Failure to do so, could result in injury or damage.

WARNING: VeinViewer Flex components are specifically designed and manufactured for use in conjunction with VeinViewer Flex. Components, parts and accessories designed by other manufacturers have not been tested by Christie and are not recommended for use with VeinViewer Flex. This could result in an increase of electromagnetic emissions or decrease in electromagnetic immunity, and/or affect the safety and effectiveness of VeinViewer Flex. Use ONLY the components listed in the VeinViewer Flex Parts List.

WARNING: DO NOT connect any other medical devices directly to VeinViewer Flex. This could cause unexpected failure of the device and VeinViewer Flex. VeinViewer Flex should not be used adjacent to, or stacked with other equipment not specified in this manual. If adjacent use is necessary, VeinViewer Flex should be observed to verify normal operation in the configuration in which it will be used, prior to starting any type of medical procedure. Portable and mobile RF communications equipment can affect VeinViewer Flex. Refer to the Technical Specification included in this manual. Failure to do so could result in injury or damage.

WARNING: DO NOT leave VeinViewer Flex unattended. Failure to do so could result in strangulation or entanglement with AC Power Adapter, USB cables or wrist strap.

WARNING: Store this equipment out of the reach of infants and children. Failure to do so could result in a choking hazard caused by swallowing a small part that has become detached from VeinViewer Flex or its accessories.

WARNING: Special precautions exist for VeinViewer Flex regarding EMC. VeinViewer Flex needs to be set-up and put into service according to the EMC information provided in the Technical Specifications in this manual. Failure to do so could result in injury or damage.

CAUTION: In case of an accidental drop event, DO NOT operate VeinViewer Flex. The drop event may affect the effectiveness of VeinViewer Flex. See CHAPTER TEN: TROUBLESHOOTING.

CAUTION: DO NOT look directly into the imaging light source when the VeinViewer Flex power is ON as the light output is very bright.

Due to the bright light output, provide the patient with Medical Facility issued eye protection when imaging neonatal patients or when imaging vasculature around the eyes or on the scalp. Refer to your institution's guidelines concerning eye safety procedures.

CAUTION: DO NOT touch, strike, or otherwise damage the glass lens of VeinViewer Flex. Please follow the recommended cleaning methods in CHAPTER EIGHT: MAINTENANCE.

CAUTION: In rare instances, shallow arteries may be detected and projected by near-infrared devices. VeinViewer Flex does not distinguish between venous or arterial vessels. Along with standard vascular access practice, palpation should be performed in addition to visualization with VeinViewer Flex of venous refill and valve detection of any blood patterns prior to vascular access to better ensure vein identification. Failure to do so could result in misidentification of an artery as a venous target.

CAUTION: Christie endeavors to supply a wide variety of VeinViewer Flex products to meet the needs of the end user and patient; however, interpretation and final application of VeinViewer Flex is the sole responsibility of the Health Care Professional using the device. Christie recommends that the Health Care Professional rely on standard health care practices prior to starting or during any type of medical procedure.

This page has been intentionally left blank.

VeinViewer Flex is designed for ease of use. VeinViewer Flex utilizes visible and near-infrared light for vascular imaging to illuminate and project the subcutaneous venous structure directly onto a patient's skin. AVIN™ (Active Vascular Imaging Navigation) allows the user to assess multiple access points with a real-time digital image.

The optional Stability Mount (S-Mount) allows VeinViewer Flex to be positioned over any part of the anatomy, leaving the clinician's hands free to perform the procedure, our trademarked EOP™ (Eyes On Patient) technique.

The expected service life of VeinViewer Flex is 5 years.

PARTS LIST

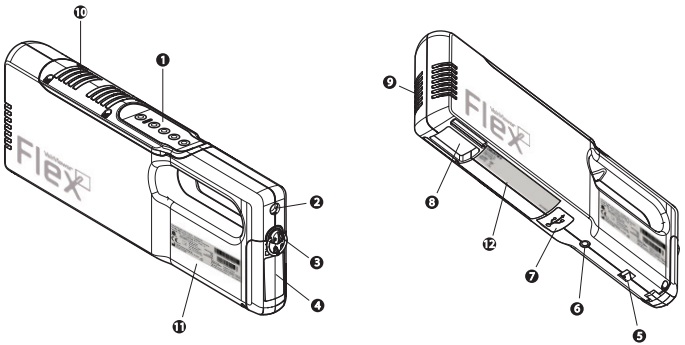
CAUTION: Verify that the following items are included with your VeinViewer Flex. If any item is missing, contact your VeinViewer Flex representative or Christie Technical Support. Use ONLY those items included in the Parts List. Failure to do so, may result in injury.

Part Number	Description
134-002102-xx	VeinViewer Flex Unit
003-003987-xx	AC Power Adapter - Manufacturer: XP Power, Manufacturer P/N:VEP24US09
003-003988-xx	Battery (QTY: 2) - Manufacturer: Inspired Energy, Manufacturer P/N: NB2037CD
003-003986-xx	Battery Charger - Manufacturer: Energy Access Inc, MFG P/N: CCC-3162
003-004015-xx	USB Cable
003-003990-xx	Wrist Strap
003-003989-xx	Storage Bag
003-003993-xx	S-Mount Arm (QTY: 2) [Quick Release Bracket and Screw Assembly (QTY: 2)]
003-003992-xx	C-Clamp Base, Super Clamp
020-300020-xx	VeinViewer Flex User Guide
000-102937-xx	DVD In-Service Training Video
000-102936-xx	VeinViewer Flex Connect Software CD

Controls, indicators, and features are illustrated and described below.

VEINVIEWER FLEX UNIT

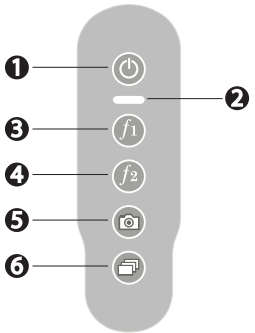
1. Control Panel
2. Power Inlet
3. Battery Door Lock
4. Battery Door
5. Wrist Strap Attachment
6. Arm Mount Attachment
7. USB Communication Port
8. Projection Window
9. Fan Inlet
10. Fan Exhaust
11. Serial Label
12. National Differences Label



CONTROL PANEL

1. Power Button
2. Status Indicator
3. *f1* Button: Resize*
4. *f2* Button: MaxBright*
5. Image Capture Button*
6. Image Mode Button
   - Universal
   - Fine Detail*
   - Inverse*

*Requires license upgrade to activate. See CHAPTER SEVEN: LICENSE, SOFTWARE AND FIRMWARE UPGRADES.



OPTIONAL ACCESSORIES

Soft Travel Case (p/n 003-003983-xx) Use this optional Case for easy portability and storage of VeinViewer Flex and accessories.

Car Charge Adapter (p/n 003-003984-xx): Manufacturer - Vanson Electronics p/n VAS-5591-A0. Use the car charge adapter to charge the Battery in a vehicle. Note that the Car Charge Adapter is only for powering the Battery Charger and will not power VeinViewer Flex.

1. Unwrap the Car Charge Adapter and insert to the 12 V jack on the back of the Battery Charger.
2. Insert the Car Charge Adapter to the car power receptacle.
3. Follow instructions from CHARGING THE BATTERY IN CHAPTER FOUR: VEINVIEWER FLEX SETUP.

CAUTION: Inspect all parts for possible shipping damage before using. In case of damage, DO NOT use VeinViewer Flex. Contact the Christie Technical Support department for further instruction. Failure to do so may affect the safety and effectiveness of VeinViewer Flex.

WARNING: Keep VeinViewer Flex dry. Do not store or operate VeinViewer Flex and components outside the recommended storage or operating temperature and humidity range, or in dusty areas. Failure to do so could lead to electrical shock, and/or result in reduction of the performance of VeinViewer Flex.

There may be instances in which condensation may develop on the inside of the projection window when the device is moved from areas where extreme temperature and humidity changes are experienced. Should this occur, please allow VeinViewer Flex to acclimate or until condensation is no longer visible.

WARNING: Failure to store and/or operate VeinViewer Flex within the recommended operating temperature and humidity parameters, could result in product deterioration, or lead to electrical shock. See CHAPTER ELEVEN: TECHNICAL SPECIFICATIONS for operating and storage specifications.

CHARGING THE BATTERY

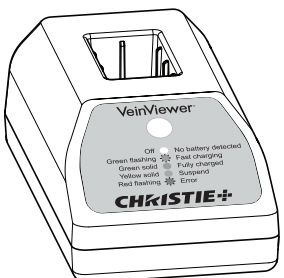
The Battery is not fully charged upon delivery of VeinViewer Flex. To maintain optimal performance, the Battery should always be fully charged prior to using VeinViewer Flex.

The battery life is designed to provide about 300 full charge/discharge cycles. The battery should be replaced after this period in order to maintain optimal performance of VeinViewer Flex.

Optimum battery storage is achieved when the battery is stored at room temperature. Exposure to high temperatures will prevent the battery from being used or from being charged. It is recommended that the battery is recharged if it is stored longer than 6 months.

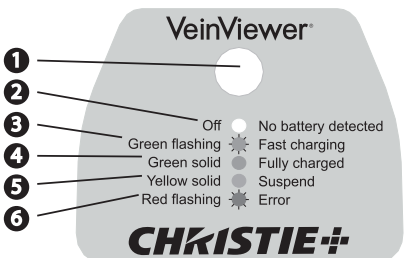
WARNING: The Battery is a lithium-ion battery, which may explode if not replaced, used, handled or disposed of properly. Dispose of the Battery as required by local ordinances or regulations. Use only batteries supplied by Christie as replacements.

Use only the Battery Charger provided by Christie. Other Battery Chargers have different voltage and terminal polarities, and their use may produce heat and smoke or even result in fire or rupture.



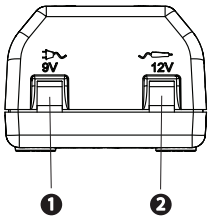
Battery Charger LED Definitions

1. LED
2. OFF-No battery detected
3. Green flashing-Fast charging
4. Green solid-Fully charged
5. Yellow solid-Suspend: Battery Charge Interrupt
6. Red flashing-Error



Battery Charger

1. 9V Inlet - Wall Outlet
2. 12V Inlet - Car Outlet



1. Unwrap the AC Power Adapter and connect the Battery Charger output plug to the 9V jack on the back of the charger.
2. Insert the pronged plug into a wall receptacle.
3. Match the grooves on the end of the Battery to the grooves in the Battery Charger cradle and insert the Battery into the Battery Charger; the battery should snap in place. The LED indicator on the Battery Charger will blink indicating the Battery is charging.
4. The Charger Status Indicator will illuminate solid green when the Battery is fully charged.

The estimated Battery life is up to approximately 2 hours of continuous run time when fully charged. Recharge time is estimated at approximately 4 hours.

When powered off with the Battery installed, VeinViewer Flex enters a low-power stand-by mode, which will drain the Battery over approximately 72 hours. To maintain battery charge over extended periods, remove the Battery from the device.

INSTALLING THE BATTERY

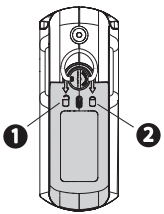
1. Rotate the Battery Door Lock counterclockwise to access the battery compartment.
2. Match the grooves on the end of the Battery to the grooves in the battery compartment.
3. Press the Battery completely into the battery compartment. Once the Battery is fully seated, an audible snap will be heard.
4. Close the Battery Door.
5. Rotate the Battery Door Lock clockwise until it stops.

The Status Indicator will blink three times, when the Battery is installed and when the AC Power Adapter in not connected.

The VeinViewer Flex Battery is NOT charging when it is installed in the battery compartment and VeinViewer Flex is plugged in via the AC Power Adapter. See the Battery Charging Section in this chapter.

Battery Door

1. Unlock (counter-clockwise)
2. Lock (clockwise)

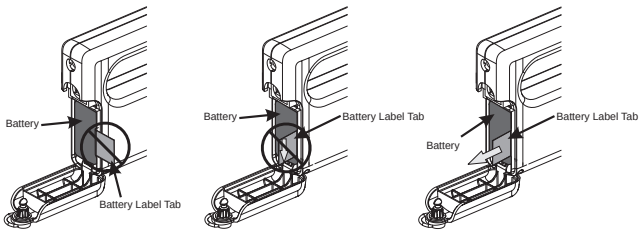


CAUTION: Do not hold VeinViewer Flex by the Battery Door Lock or touch the Lock while operating VeinViewer Flex as this may result in unintentional release of the Battery Door.

REMOVING THE BATTERY

Pull the battery tab directly out from the battery compartment.

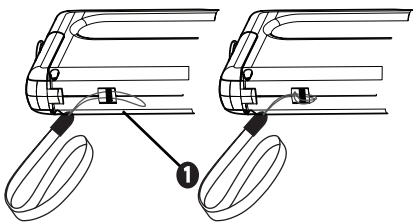
Do not bend the battery tab over the edge of the battery compartment or pull down on the battery tab to remove the battery as this may put undue stress on the battery tab.



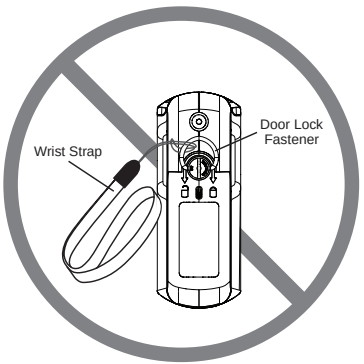
ATTACHING THE WRIST STRAP

CAUTION: Be careful when carrying VeinViewer Flex by the Wrist Strap. DO NOT swing VeinViewer Flex on the Wrist Strap, and keep the Wrist Strap and VeinViewer Flex clear of obstacles, as this may result in accidental impact and affect the effectiveness of VeinViewer Flex.

1. Push the looped string under and around the metal strap eyelet, and then pass the strap through the loop.



CAUTION: DO NOT attach the Wrist Strap to the Battery Door Lock. This may result in accidental drop or impact and affect the effectiveness of VeinViewer Flex.



For your convenience, VeinViewer Flex is ready for use once the fully charged Battery is installed; however, Christie recommends connecting VeinViewer Flex to a PC connection prior to operating the device to ensure the date and time on the device are set correctly. See CHAPTER SEVEN: LICENSE, SOFTWARE AND FIRMWARE UPGRADE.

S-MOUNT SETUP

WARNING: Please make sure that the Clamp, S-Mount and VeinViewer Flex are properly secured after installation, following ANY adjustments, repair or service and BEFORE USE; otherwise serious injury or loss of life could result.

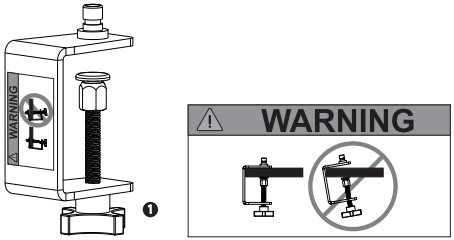
WARNING: DO NOT place, hang, or otherwise apply weight to the S-Mount, IV pole or stand system when supporting VeinViewer Flex. This may result in improper device loading and could result in serious injury.

To ensure longevity of the S-Mount DO NOT bend the arm smaller than a 4 in. (10 cm) radius during operation of VeinViewer Flex.

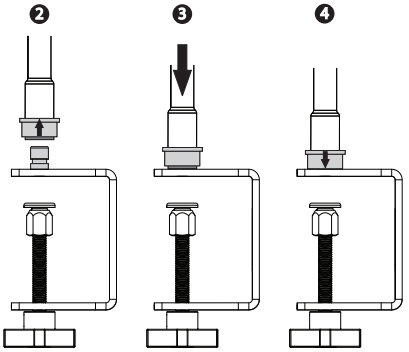
C-CLAMP: The C-Clamp is provided to attach VeinViewer Flex to FLAT surfaces such as a table or counter top.

CAUTION: The C-Clamp shall be mounted to a flat surface with a desk thickness of 0.5 in. (1.3 cm) to 2.5 in. (6.3 cm). DO NOT mount the C-Clamp to other surfaces beyond what is indicated in the manual as this could affect the safety and effectiveness of VeinViewer Flex.

1. Tighten knob until the C- Clamp is firmly secured to a horizontal mounting surface, such as a table.



2. Pull the S-Mount Quick Release Connector in the direction shown.
3. Place the Quick Release Connector on the mating stud on the Clamp.
4. Release the Quick Connector.

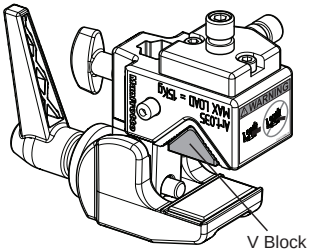


Periodic inspection and maintenance of the arm and quick release should be performed to extend the efficiency and life of the arm. Contact Christie Technical Support for proper preventive maintenance procedures.

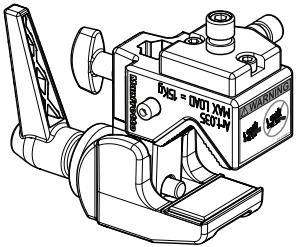
SUPER CLAMP: The Super Clamp is provided to allow mounting to a flat surface as well as alternate round or square surfaces such as a bed rail or IV pole.

WARNING: The health-care professional shall be responsible for ensuring VeinViewer Flex and mobile system (such as an IV Pole) is stable, and does not tip during set-up, operation, transport, and storage, by making sure VeinViewer Flex and S-Mount are properly mounted to IV Stands or IV Poles with the specifications outlined on this page.

IV Stand Specifications	IV Pole Specifications
Max arm overhang: 28 in. (71.1 cm)	Max arm overhang: 28 in. (71.1 cm)
Max floor-to-Clamp height: 57 in. (144.7 cm)	Max floor-to-Clamp height: 62 in. (157.5 cm)
Min base weight: 16.5 lbs (7.5 kg)	Min base weight: 4 lbs (1.8 kg)
Min base size: 19.0 in. (48.3 cm)	Min base size: 23.25 in. (59.0 cm)
Pole diameter: 0.75 in. (1.9 cm) - 1.0 in. (2.5 cm)	Pole diameter: 0.75 in. (1.9 cm) - 1.0 in. (2.5 cm)
Min wheel diameter: 2.75 in. (7.0 cm)	Min wheel diameter: 2 in. (5.0 cm)
Min number of wheels: 5	Min number of wheels: 5



Clamp Configuration for Mounting to a Flat Surface



Clamp Configuration for Mounting to a Pole (Example; IV Stand, IV Pole, Bed Rail)

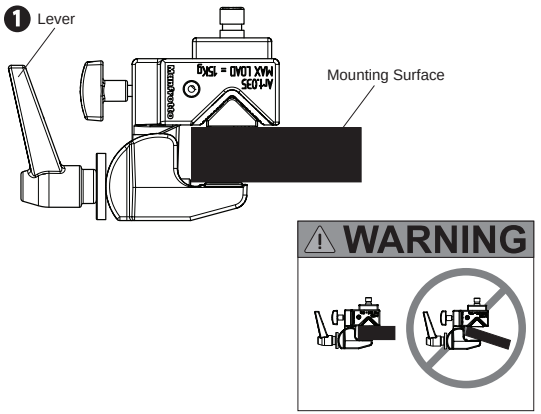
WARNING: DO NOT leave VeinViewer Flex or S-Mount PERMANENTLY mounted to Bed Rails. This condition could result in bed entrapment.

CAUTION: The Super Clamp shall be mounted to a flat surface with a maximum desk thickness of 1.3 in. (3.2 cm). DO NOT mount the Super Clamp to other surfaces beyond what is indicated in the manual.

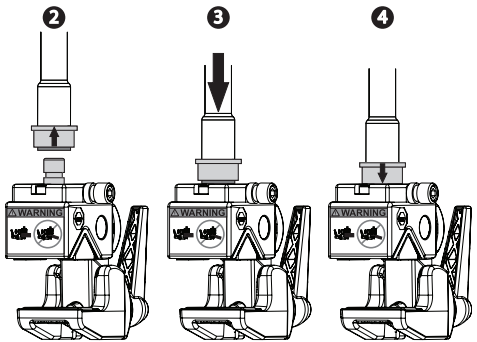
Please ensure the V-Block Flat Surface Adapter is properly secured to the Super Clamp before mounting the Clamp to a flat surface; otherwise, improper device loading may occur.

SUPER CLAMP MOUNTING - FLAT SURFACE:

1. Turn the lever clockwise until the Super Clamp is secured to the flat mounting surface. The surface may be horizontal or vertical.

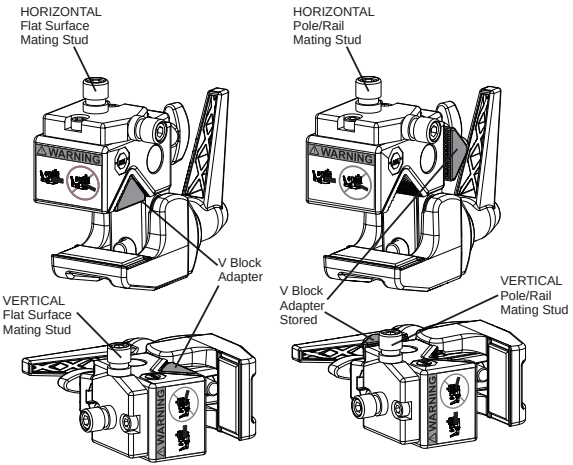


2. Pull the S-Mount Quick Release Connector back.
3. Place the Quick Release Connector on the mating stud on the Super Clamp.
4. Release the Quick Connector.



Super Clamp Mounted to Horizontal Surface

WARNING: Use the proper mating stud associated with vertical or horizontal mounting surface orientation to avoid possible serious injury.



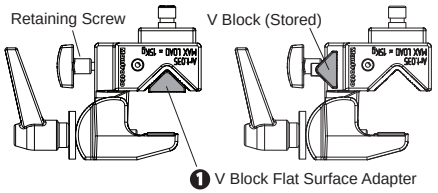
SUPER CLAMP MOUNTING - CURVED SURFACE:

CAUTION: The Super Clamp can be safely mounted to a FIXED pole with a Minimum 0.5 in. (1.3 cm) to a Maximum 2.1 in. (5.5 cm) diameter. DO NOT mount the Super Clamp to other surfaces beyond what is indicated in the manual.

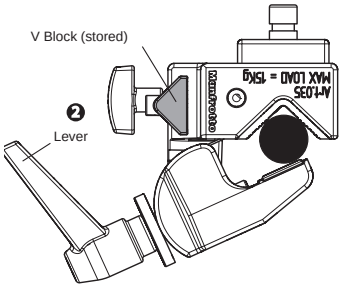
For IV Stand or IV Pole mounting parameters, see page 18 of the manual.

Please ensure the V-Block Flat Surface Adapter is removed from the Super Clamp base before mounting the Clamp to a pole or bed rail; otherwise, improper device loading may occur.

1. Remove the V-Block Flat Surface Adapter from the Super Clamp by prying it loose from the clamp. The V-Block Flat Surface Adapter stores under the Retaining Screw when not in use.



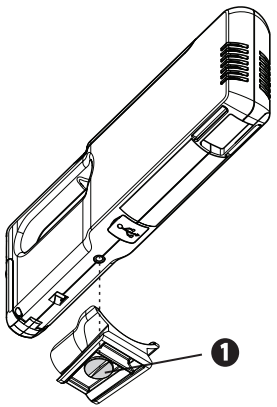
❷ Turn the lever clockwise until the Super Clamp is secured to the curved mounting surface. The surface may be horizontal or vertical.



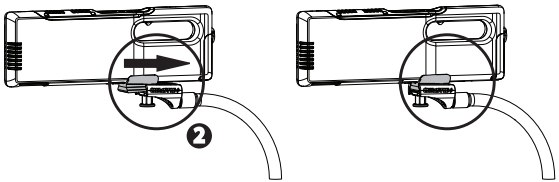
ATTACHING VEINVIEWER FLEX TO S-MOUNT

WARNING: Please ensure the S-Mount Quick Release is properly engaged to the mating stud on the C-Clamp or Super Clamp by pulling on the arm.

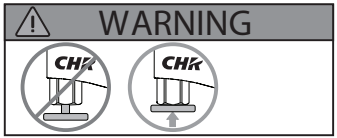
❶ Attach the Mounting Bracket to VeinViewer Flex, securing the captive screw firmly to VeinViewer Flex using a flat head screwdriver or a coin.



❷ Slide VeinViewer Flex into the Mounting Bracket on the S-Mount until it clicks into place.



WARNING: Make sure the release pin is properly engaged by pulling on VeinViewer Flex before starting any type of medical procedure. See illustration below.



CAUTION: Christie endeavors to supply a wide variety of VeinViewer Flex products to meet the needs of the end user and patient; however, interpretation and final application of VeinViewer Flex is the sole responsibility of the Health Care Professional using the device. Christie recommends that the Health Care Professional rely on standard health care practices prior to starting or during any type of medical procedure.

This page has been intentionally left blank.

POWERING VEINVIEWER FLEX

VeinViewer Flex may be operated by AC Power Adapter or Battery power.

WARNING: VeinViewer Flex is shipped with a detachable AC Power Adapter rated specifically for VeinViewer Flex.

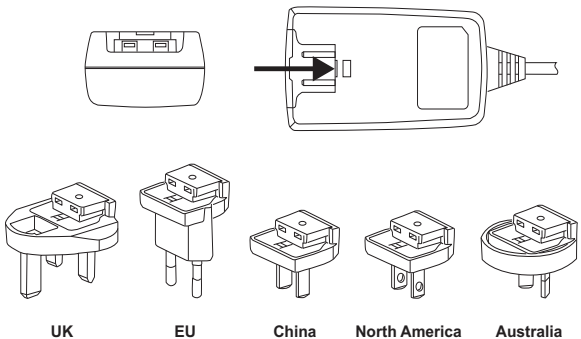
VeinViewer Flex is compliant with IEC 60601-1 National differences for: Austria, Australia, Belgium, Brazil, Canada, Switzerland, Czech Republic, Germany, Denmark, Finland, France, United Kingdom, Greece, Hungary, Ireland, Israel, India, Italy, Japan, Kenya, Korea, Netherlands, Norway, Poland, Portugal, Serbia, Russian Federation, Sweden, Slovakia, Slovenia, Turkey, Ukraine, United States.

Before you connect VeinViewer Flex to a power source, ensure that the voltage rating of the Power Supply matches that of the available power source.

The AC Power Adapter acts as the MAINS disconnect.

Inspect the AC Power Adapter on a regular basis to avoid the risk of electrical shock and/or fire hazard. If the Power Cord and plug are or appear damaged DO NOT use VeinViewer Flex and immediately contact the Christie Technical Support department for further instruction.

The AC Power Adapter is equipped with interchangeable input connectors. To change the input connector slide the desired connector (prongs up) onto the adapter in direction shown.



CAUTION: Ensure the input connector is properly engaged to the AC Power Adapter. An Audible snap will be heard; failure to do so could affect the safety and effectiveness of VeinViewer Flex.

The AC Power Adapter allows you to operate VeinViewer Flex continuously without the use of the Battery.

The VeinViewer Flex Battery is NOT charging when VeinViewer Flex is plugged in via the AC Power Adapter. See the Battery Charging Section in CHAPTER FOUR: VEINVIEWER FLEX SETUP.

The use of the AC Power Adapter is recommended when you connect VeinViewer Flex to a PC.

If operating by Battery power, skip steps 1 and 2.

1. Connect the AC Power Adapter to the VeinViewer Flex Power Inlet.
2. Plug the other end into an electrical outlet.
3. Press and release the Power Button located on the Control Panel. The Status Indicator in the Control Panel should illuminate solid green when VeinViewer Flex is powered ON.

POWERING OFF VEINVIEWER FLEX

1. Press and release the Power Button again to power down VeinViewer Flex. The Status Indicator will turn OFF.
2. Unplug the AC Power Adapter from the electrical outlet.
3. Remove the AC Power Adapter from VeinViewer Flex Power inlet.

FOCUSING

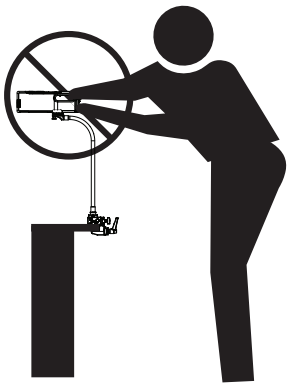
Focus is achieved when the text around the border of the image is clear and legible (see image sample). The focusing distance for VeinViewer Flex is approximately 12 in. (30 cm) for optimal focus.

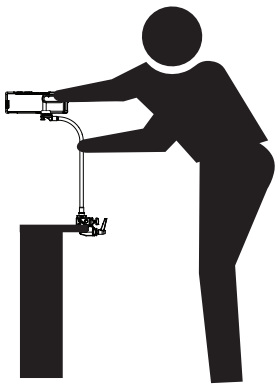
CAUTION: VeinViewer Flex must be positioned as closely as possible to a 90-degree angle, perpendicular to the surface of the patient's anatomy to be imaged; otherwise, the projected image may appear skewed or distorted. The practitioner's line of sight should follow the projected imaging light as closely as possible.

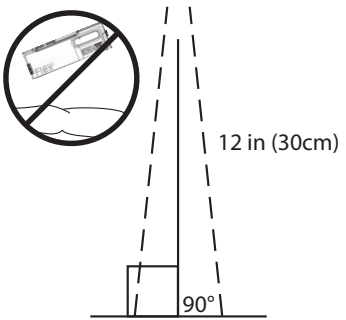
FOCUSING PROCEDURE

1. Position VeinViewer Flex so that it is perpendicular to the area to be imaged, as shown on the following page.
2. Position VeinViewer Flex close, within a few inches of the assessment area, and slowly move VeinViewer Flex away to the focal distance, approximately 12 in. (30 cm) from the target location.
3. Focus is achieved when the text around the border of the image is clear and legible.

CAUTION: Adjust the focal distance of VeinViewer Flex by moving the S-Mount arm and VeinViewer Flex together. Pulling on VeinViewer Flex alone to adjust may result in accidental dislodgment of the Mounting Bracket.







Before proceeding to use VeinViewer Flex on the patient, ensure VeinViewer Flex is in focus, and familiarize yourself with the IMAGING MODES and IMAGING FEATURES sections in this Chapter.

CAUTION: The VeinViewer Flex image may show a slightly different vessel width than the size of the actual vessel. This effect may vary from subject to subject, from one location of the body to another, and between imaging modes. Christie recommends that the health-care professional rely on standard health-care practices prior to starting or during any type of medical procedure.

IMAGING MODES

The image mode can be changed by pressing the Image Mode Button, located on the Control Panel.

Features marked with an "*" require a license upgrade. See license upgrade section in the CHAPTER SEVEN: LICENSE, SOFTWARE AND FIRMWARE UPGRADE

- Universal: Standard imaging modes. Appropriate for all patients.
- Fine Detail*: Used for viewing finer image details. Helpful for pediatrics, neonates, or sclerotherapy patients.
- Inverse*: Inverts the color within the image to project green veins on a dark background.

The image mode will be displayed in the border text within the projected image. See PROJECTED IMAGE DISPLAY in this chapter.

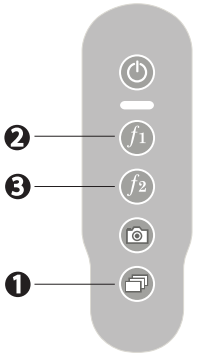
❶ To adjust the Imaging Mode press the Mode button. VeinViewer Flex will cycle through the Modes in the following order:

1. Universal
2. Fine Detail*
3. Universal in Inverse*
4. Fine Detail in Inverse*

IMAGING FEATURES

❷ Resize*: Adjusts the image to one of three different sizes. The image size can be adjusted to one of 3 sizes by pressing and releasing the f1 button located on the Control Panel.

❸ MaxBright *: Adjusts the image brightness to two different brightness levels by pressing and releasing the f2 button located on the Control Panel. Helpful for use in environments with higher ambient light levels.



ⓘ Resize and MaxBright may be used with all other imaging modes.

4 Image Capture*: Captures a time stamped static image of the projected vein image and saves the image as a BMP file on VeinViewer Flex. The captured image can be transferred to a PC via a USB connection. Refer to the USB connection section in the PC Software in CHAPTER SEVEN: LICENSES, SOFTWARE AND FIRMWARE UPGRADES.

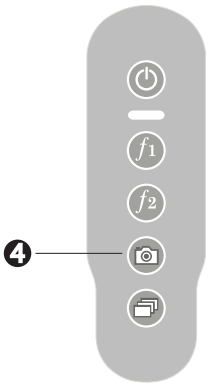


IMAGE CAPTURE PROCEDURE

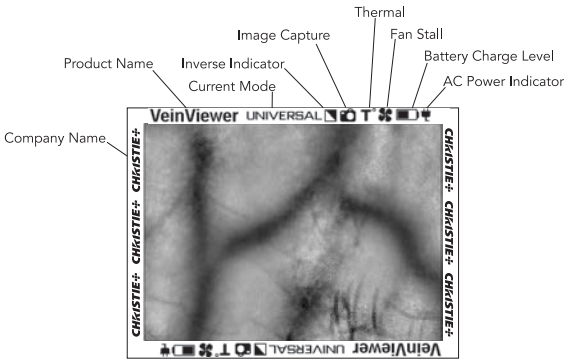
Press the Image Capture Button, located on the Control Panel.

VeinViewer Flex DOES NOT capture patient information. The captured images are date and time stamped ONLY.

VeinViewer Flex allows for 200 images to be captured at a given time. The oldest image will be automatically deleted from VeinViewer Flex when memory reaches capacity and a new image is captured.

When Image Capture is engaged, it may take several seconds for the image to be saved to VeinViewer Flex. During this period, the Image Capture icon will be displayed on the image border rendering the keypad and its related functions inoperable. VeinViewer will still be able to image subcutaneous blood patterns on the surface of the skin during this time period. Keypad functionality will resume once the image captured icon disappears.

PROJECTED IMAGE DISPLAY



STATUS INDICATOR

The following table explains each of the messages that may appear on the Status Indicator, located on the Control Panel.

STATUS INDICATOR	MESSAGE
Solid Green	VeinViewer Flex is powered on
Solid Red	Battery Level < 25%
Blinking Red (Repeatedly)	Battery Level < 10%
Solid Orange	System Notice - See icons on image border and see CHAPTER TEN: TROUBLESHOOTING
OFF	Standby Mode or powered off if no Battery or AC Power Adapter plugged in.
Flash Orange	Invalid button press

SOFTWARE VERSION

The VeinViewer Flex software version is displayed when f1 is pressed and held for 3 seconds and then released. To deactivate display window, press f1 and hold for 3 seconds.

This page has been intentionally left blank.

VeinViewer Flex comes equipped with VeinViewer Flex Connect software which allows the user to sync the date and time on the device, manage images on the device, display device status, license upgrades, software, and Firmware upgrades via a USB connection to a PC.

When conducting a license, software or firmware upgrade, ensure it is through a Christie Authorized representative or distributor. Please contact Christie Technical Support for further instructions.

DO NOT upload unauthorized files to the device. This may result in impairment of device functionality.

VEINVIEWER FLEX CONNECT SOFTWARE INSTALLATION

Operating Systems: Windows 7 recommended, Windows XP SP3 (32-bit) supported. If you do not have administrative rights to your PC, you may need to contact your network administrator to grant you access to install VeinViewer Flex Connect software.

The USB does not provide power to the device.

Plug in the AC Power Adapter or insert a fully charged battery to VeinViewer. DO NOT power ON the device.

Connect VeinViewer Flex directly to a USB port on the computer. The interface may not operate correctly when connected through a USB hub.

FLEX CONNECT INSTALLATION

1. Insert included VeinViewer Flex Connect software CD, launch the CD from "My Computer".
2. Double-click the VeinViewer Flex Connect installer icon to begin the installation process.
   Note: When prompted to accept software installation from publisher, click “Run”.
3. The VeinViewer Flex Connect Setup Wizard will appear. Follow the on-screen instructions and accept the LICENSE AGREEMENT to continue with the installation process.
4. **If PC is running on Windows 7, select "Install" when prompted to install device drivers.**
   If PC is running on Windows XP SP3 (32-bit), select "Continue Anyway" when prompted to install device drivers.
5. Once installer is completed, click “Finish”.

CONNECTING VEINVIEWER FLEX TO YOUR PC

Make sure that the VeinViewer Flex Connect software has been installed prior to connecting VeinViewer Flex to your PC.

1. Plug in the AC Power Adapter or insert a fully charged battery to VeinViewer. DO NOT power ON the device.
2. Connect the supplied USB Cable to the computer's USB port and the VeinViewer Flex USB Communication Port. Note: The first time you connect VeinViewer Flex to your PC, the Drivers Install popup should appear. You may be prompted to install drivers. Wait until Windows reports that the device is ready for use.
3. Launch the VeinViewer Flex Connect Software. The "VeinViewer Flex Connect" window will appear and should list available VeinViewer devices such as " \\.\COM#" under "Device(s):". Click the 'Connect' icon to begin. You may need to click the 'Refresh' icon, if no devices are listed. If problem persist, see CHAPTER TEN: TROUBLESHOOTING.
4. The first time VeinViewer is connected to a PC, you may be prompted to update the time on VeinViewer to match the time on the PC. Click "Yes."

VEINVIEWER FLEX CONNECT IMAGE MANAGEMENT

- Display a list of images
- Show image previews
- Copy or move images to PC from VeinViewer
- Image format conversion to BMP, PNG, TIF or JPG
- Delete images from VeinViewer

Stored images on the device will appear under "Manage Images" in the "Home" tab of the Flex Connect Software.

When transferring images to a PC, the user may save the images to the directory of their choice.

Note: Captured Images will appear as "00000001_Year-Month-Day-T-Hr-Min-Sec", when saved onto a PC, to document the date and time when images where taken with VeinViewer.

License Upgrade: After purchase, enter the activation codes to enable the optional imaging modes and features.

Note: Activation codes are device specific and must be obtained from Christie Technical Support, www.veinviewer.com or 877 SEE VEIN (733-8346).

License and Copyright Information: Detailed copyright information is available by clicking "Help>About".

CLEANING

WARNING: Always power OFF and disconnect VeinViewer Flex from electrical outlets before cleaning. Failure to do so, may affect the safety and effectiveness of VeinViewer Flex.

This section is intended to assist you in effective cleaning of VeinViewer Flex. It is also intended to protect the delicate VeinViewer Flex components during the cleaning process.

VeinViewer Flex

1. Use a lint-free cloth moistened with 70% isopropyl alcohol or Super Sani-Cloth or SANI-CLOTH PLUS, or CaviWipes, or 1:10 Bleach Wipes to wipe down the VeinViewer exposed surfaces.
2. Air-dry or towel-dry with a clean, lint-free cloth.
3. Blow dehydrated ionized air to maintain the Fan Louvers free of dust and debris.

Lens

1. The VeinViewer Flex lens should be cleaned with a lint-free cloth moistened with 70% isopropyl alcohol ONLY.
2. Towel-dry with a clean, lint-free cloth.

Cleaning methods listed are recommended for compatibility with VeinViewer Flex materials. Cleaning frequency should be performed in accordance with your individual institution's infection control guidelines.

For more information about the compatibility of cleaning solutions for VeinViewer Flex, please contact Christie Medical Holdings or your local VeinViewer Flex representative. Failure to adhere to the following recommendations could damage VeinViewer Flex and void the warranty.

CAUTION: DO NOT spray cleaners or pour liquids directly onto the VeinViewer Flex surfaces. Doing so may cause excessive fluids to enter and potentially damage VeinViewer Flex.

Christie recommends the use of protective eye wear and gloves when cleaning VeinViewer Flex. Refer to your individual institution's policy and procedure for use of personal protective equipment while cleaning medical devices.

DO NOT use solvents or abrasive cleaners on any part of VeinViewer Flex. Products and solutions other than those recommended may damage VeinViewer Flex and will void the warranty.

VEINVIEWER FLEX DISPOSAL

Do not expose to fire, or dispose of in fire. Please ensure that the VeinViewer Flex, Battery, AC Power Adapter, Battery Charger, and accessories are properly disposed of, as inappropriate waste handling of this product may cause potential hazards to the environment and human health. For more detailed information about recycling of this product, please follow your institution's guidelines or contact your waste disposal service or Christie Technical Support.

Please ensure all stored images from the device are saved on your PC, and delete all captured images from the device prior to sending the VeinViewer Flex units for service.

Christie Medical Holdings is committed to helping you get the greatest value from the use of your VeinViewer Flex. While VeinViewer Flex is of high quality, we do realize that from time to time, you may need support for technical or user issues. Please use CHAPTER TEN: TROUBLESHOOTING to determine the answer to your question, or contact the Christie Technical Support by telephone, by e-mail, or online.

Christie Technical Support Hours:
Monday – Friday
8:00 a.m. – 5:00 p.m. CST

E-mail: info@veinviewer.com (accepted on a 24-hour basis)

Web site: www.christiemed.com

Telephone:
1-901-721-0330
1-877-SEE-VEIN (1-877-733-8346 toll-free)
International: +01-901-721-0330

Fax:
1-901-721-0350
International: +01-901-721-0350

Unauthorized or improper use of VeinViewer Flex will void the limited warranty. Service may be done by an authorized Christie Medical Holdings representative.

The limited warranty will not apply to any product which is or has been subjected to:

- Alteration or repair, except with authorization from Christie Medical Holdings technicians;
- Misuse, improper maintenance, negligence, or accident;
- Damage from excessive current, temperature, or other deviation from the applicable environmental specifications (see Storage and Handling Specifications);
- Alteration, defacement, or removal of the serial number (or any part thereof).

Christie Medical Holdings is committed to the quality of our products. You can reach our Christie Technical Support with any questions or comments regarding service contract options, in-service training, sales, or support by visiting www.veinviewer.com, e-mailing info@veinviewer.com, or by calling 1-877-SEE-VEIN (1-877-733-8346 toll-free). For international calls, dial +01-901-721-0330.

SERVICEABLE ITEMS BY USER

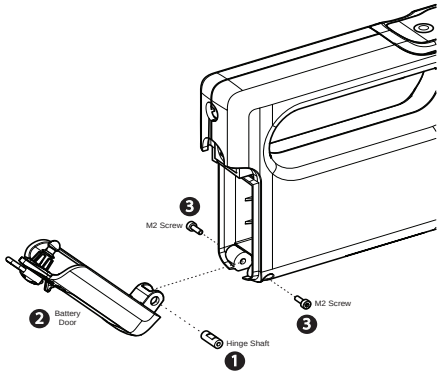
Battery Door (p/n 003-003977-xx)

See INSTALLING THE BATTERY in CHAPTER FOUR: VEINVIEWER FLEX SETUP.

First, use a 1.5 mm Hex Driver to remove the damaged Battery Door, then:

1. Insert Hinge Shaft in bottom of the new Battery Door.
2. Place Battery Door onto VeinViewer Flex (fully in place).
3. Insert and hand-tighten the M2 Screws (2). Ensure the screws are properly tightened with a 1.5 mm Hex Driver. A small flat-head screwdriver is required to prevent the hinge shaft from rotating while installing the screws.

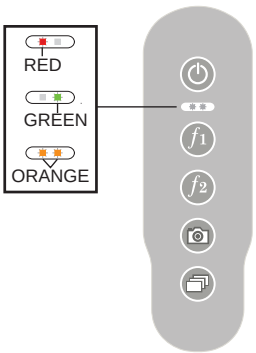
i Hex Driver and screwdriver not provided.



i The Battery Door should be able to rotate freely. Please ensure the Battery is able to lock/unlock properly.

If the solutions in the troubleshooting section do not resolve problem, contact Technical Service. For contact information, see CHAPTER NINE: SERVICE AND SERVICEABILITY.

For additional clarification of color distinction of the Status Indicator, please examine the Control Panel closely, and refer to the following image.



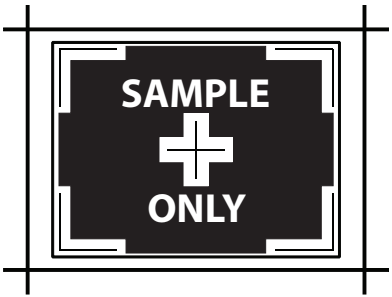
DROP EVENT

CAUTION: Stop operating VeinViewer Flex if it is dropped. Failure to do so may result in degradation of performance. Immediately switch power OFF to VeinViewer Flex, remove the Battery and unplug the AC Power Adapter from the electrical outlet if connected.

Please conduct the following steps or contact your local distributor or Christie Technical Support team.

1. Inspect the VeinViewer Flex outer casing. If it does not appeared damaged, proceed to next step. If it appears damaged, DO NOT use. See CHAPTER NINE: SERVICE AND SERVICEABILITY.
2. Inspect the VeinViewer Flex Projection Window. If it does not appear damaged, proceed to next step. If it appears damaged, DO NOT use. See CHAPTER NINE: SERVICE AND SERVICEABILITY.
3. Inspect the VeinViewer Flex Battery. If it does not appear damaged, proceed to next step. If it appears damaged, DO NOT use, and discard the Battery. See "VEINVIEWER FLEX DISPOSAL" in CHAPTER EIGHT: MAINTENANCE.
4. Turn ON VeinViewer Flex and operate by Battery power. Toggle through the image modes and ensure the projected image is in focus and is properly displayed per CHAPTER SIX: OPERATING INSTRUCTIONS.

5. Mount the device 12 in. (30 cm) away from Test Pattern Image to check the image alignment. Ensure VeinViewer Flex is perpendicular to the Alignment Test Pattern located on the inside back cover of this manual. Adjust the distance of the target in order that the border of the projected image is aligned to the largest rectangle of the target.



6. Evaluate alignment by looking for separation (white space) between projected line and printed line.

If there is any separation between the printed line and the projected line in ANY of the 5 horizontal and/or vertical positions, VeinViewer Flex is not within alignment specifications. Please contact Christie Technical Support.

You may receive a notification regarding a possible drop event when connecting VeinViewer Flex to the VeinViewer Flex Connect software. A popup window prompts you to 'Reset: Yes or No'. Select *Yes* if VeinViewer is in proper alignment.

CORRECT ALIGNMENT Projected Line Exactly Matches Printed Line	GOOD ALIGNMENT Projected Line Overlaps Printed Line	INCORRECT ALIGNMENT White Space Between Projected and Printed Lines

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
VeinViewer Flex does not power ON	Status Indicator is Off	VeinViewer Flex is turned OFF	Press the Power Button for a full second.
		Battery does not have sufficient charge	Replace with spare fully charged Battery, recharge primary Battery, or operate VeinViewer Flex by plugging the AC Power Adapter into a standard power receptacle. Note: If the SUSPEND or ERROR Status Indicator on the Battery Charger is lit, the battery is not charging properly. Remove Battery from Battery Charger per "Battery Charging" procedure in CHAPTER FOUR: VEINVIEWER FLEX SETUP. If the Battery still does not charge properly, contact your local distributor or Christie Technical Support for replacement Battery.
		Batteries are not making good electrical contact	Be sure the Battery is properly secured inside the Battery compartment. Wipe the Battery grooves with a CLEAN dry cloth. Be sure the Battery Door is closed securely.
		(If operating by AC power) AC Power Adapter is damaged	DO NOT use or attempt to repair AC Power Adapter. Immediately contact Christie Technical Support.

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
VeinViewer Flex does not power ON (cont'd)	Status Indicator is Off	(If operating by AC power) AC Power Adapter is not making good electrical contact	Be sure the AC Power Adapter is fully plugged into VeinViewer Flex Power Inlet. Be sure the interchangeable input connector is properly connected to the AC Power Adapter. Be sure the plug is properly connected to a standard power receptacle. The wall receptacle should provide between 100 – 240 VAC at 50/60 Hz.
	Status Indicator is Off	VeinViewer Flex thermal overload; ambient operating, or storage specifications have been exceeded	Remove the Battery from device, and inspect Battery for damage. If operating by wall power, disconnect the AC Power Adapter from VeinViewer Flex and wall receptacle. Remove VeinViewer Flex from extreme operating /storage conditions, and allow VeinViewer Flex to return to normal ambient conditions for at least 15 MINUTES before attempting to repower. Note: Check if the Status Indicator blinks green 3 times, when attempting to repower VeinViewer Flex.
VeinViewer Flex turns OFF unexpectedly	Blinking red (repeatedly)	Battery does not have sufficient charge	Replace with fully charged spare Battery, recharge primary Battery, and operate VeinViewer Flex by plugging the AC Power Adapter into a standard power receptacle.

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
No visible change in the image field or functionality when a feature button is pressed	Imaging mode icon in image border	Control Panel button not properly pressed	Firmly press and release alternate Control Panel buttons to verify Control Panel functionality. Note: Make sure, desired modes and features have been enabled using the VeinViewer Flex Connect software. See the "IMAGING MODES" section in CHAPTER SIX: OPERATING INSTRUCTIONS for licensed imaging modes and features.
Projected image appears out of alignment	Drop event notification shown when connecting VeinViewer to VeinViewer Flex Connect software.	VeinViewer Flex was accidently dropped	See "DROP EVENT" in this chapter.
Projected image is out of focus	Image border text appears blurry	VeinViewer Flex is not set to optimal focusing distance	See "FOCUSING PROCEDURE" in CHAPTER SIX: OPERATING INSTRUCTIONS.
Projected image does not properly display veins	None	VeinViewer Flex is being operated outside or in direct sunlight	Do not use the VeinViewer Flex outside or in direct sunlight. See the recommended operating conditions in CHAPTER ELEVEN: TECHNICAL SPECIFICATIONS.

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
System Notice	Status Indicator is solid Orange and the Thermal icon T° is displayed on the projected image Status Indicator is solid Orange and Fan Icon is displayed on projected image	Unusual Operating Temperature Fan Stall	If operating by wall power, disconnect the AC Power Adapter from VeinViewer Flex and wall receptacle. Remove the Battery from device, and inspect Battery for damage. Remove VeinViewer Flex from abnormal operating conditions, and allow VeinViewer Flex to return to normal ambient conditions for at least 15 MINUTES. If fan warnings persist or appear repeatedly, refer to CHAPTER EIGHT: MAINTENANCE for cleaning instructions.
VeinViewer Flex Connect does not properly install	None	Operating systems	Ensure PC is running on Windows 7 or Windows XP, SP3 (32-bit).
		Lack of PC administrative rights	Ensure you have administrative rights or contact your IT department.
		While installing, Windows warns that the software publisher is unknown	When the Windows Unknown Publisher warning message is displayed during installation, click "Accept".
		Required Windows files in use	Restart computer and retry installation.
		Previous Veinviewer Flex Connect software version is installed on your Computer.	Uninstall the previous version of Flex Connect software from your computer. Restart the computer and retry installation.

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
Unable to establish USB connection to VeinViewer Flex	None	USB connectivity issue connected	Restart the PC. Make sure the USB Cable is properly installed to VeinViewer Flex and to the USB Communication Port on the PC. After connecting device, wait 30 seconds then click "Refresh" on the screen (may take several seconds). The VeinViewer should be listed on the "Device(s):" pull down menu as "\\.\COM_. Select "connect". The Device Control panel on the Flex Connect software should now be active. **Note:** The first time you connect VeinViewer Flex to your computer it may take several minutes to be recognized and install the appropriate drivers.
	None	VeinViewer Flex is not connected to a power source	Make sure Flex Connect software is running and that VeinViewer is connected to a power source, but NOT turned ON. Disconnect and re-connect the VeinViewer. Wait 30 seconds then click "Refresh" on the screen. (This may take several seconds). If VeinViewer was not listed in the pull down menu, proceed to other possible CAUSE below.

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
Unable to establish USB connection to VeinViewer Flex	None	VeinViewer device drivers were not properly installed	Make sure Flex Connect software is running and that VeinViewer is connected to a power source, but NOT turned ON. **WINDOWS 7** Disconnect and re-connect VeinViewer to the PC via USB connection. The "Installing device driver software" pop-up should come up on the windows status bar. The device driver should automatically install. On the "VeinViewer -Connect" prompt, select "Refresh" button. The VeinViewer should be listed on the "Device(s):" pull down menu as "\\.\COM#. Select "Connect", the Device Control panel on the Flex Connect software should now be active. If VeinViewer was not listed in the pull down menu, proceed to step below. From the windows start menu, select the "Install VeinViewer Flex Drivers" located in the "Christie" folder. Click "Next" in the "Device driver installation wizard" prompt. Select the checkbox for "Always trust software from Christie Medical Holdings", and then select "Install" in the windows security prompt. A notification should appear that drivers were successfully installed. Select "Refresh" in the "VeinViewer-Connect" prompt. The VeinViewer should be listed on the "Device(s):" pull down menu as "\\.\COM#. Select "Connect", the Device Control panel on the Flex Connect software should now be active.

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
		VeinViewer device drivers were not properly installed (cont'd)	**WINDOWS XP** Connect VeinViewer to the PC via USB connection. The "New Hardware Wizard" screen will appear. Select "Install the software automatically", and click "Next". On the "VeinViewer -Connect" prompt, select "Refresh" button. The VeinViewer should be listed on the "Device(s):" pull down menu as "\\.\COM#. Select "Connect", the Device Control panel on the Flex Connect software should now be active. If VeinViewer was not listed in the pull down menu, proceed to step below. From the windows start menu, select the "Install VeinViewer Flex Drivers" located in the "Christie" folder. Click "Next" in the "Device driver installation wizard" prompt. The "Software Installation" screen should appear. Select "Continue Anyway". A notification should appear that drivers were successfully installed. Click "Finish". Select "Refresh" in the "VeinViewer-Connect" prompt. The VeinViewer should be listed on the "Device(s):" pull down menu as "\\.\COM#. Select "Connect", the Device Control panel on the Flex Connect software should now be active.

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
Unable to update License Image Modes and Features to VeinViewer Flex	None	USB connectivity issues	See previous section on USB connectivity issue.
	None	16 digit License Code not Valid	Re-enter code, with no spaces, as directed by Christie. NOTE: DO NOT enter device serial number. Sample License Code: ABCD-1234-5678-EFGH NOTE: License codes are unique to serialized VeinViewer Flex units.
Unable to convert image files	None	VeinViewer Flex Connect did not install correctly	Reinstall VeinViewer Flex Connect. Ensure you are using latest version of VeinViewer Flex Connect software.
Unable to locate saved images on PC	None	Unable to locate default location of images	On next image transfer, VeinViewer Flex Connect software will default to most recent image save location. The Christie folder may contain downloaded images from the device.
Unable to download images from VeinViewer Flex	None	USB connectivity issues	See previous section on USB connectivity issue.
		Image Capture Feature not enabled.	Requires License Upgrade.
		No images captured	"IMAGE CAPTURE PROCEDURE" in CHAPTER SIX: OPERATING INSTRUCTIONS

PROBLEM	STATUS INDICATOR	CAUSE	SOLUTION
Error pop-up while using VeinViewer Flex Connect	None	Windows error	Follow on screen Windows instructions. Disconnect VeinViewer Flex from the PC. Restart the PC. Reset VeinViewer Flex by removing the Battery and AC Power Adapter from VeinViewer Flex. Wait for 5 seconds, then reinstall the Battery and then Plug the AC Power Adapter to VeinViewer Flex. Power up VeinViewer Flex. Reconnect VeinViewer Flex to PC via USB Connection. Restart the VeinViewer Flex Connect software. If problem persists, document the error description and contact Christie Technical Support.

This page has been intentionally left blank.

VEINVIEWER FLEX TECHNICAL SPECIFICATIONS

Model Number	134-002102-xx
Version, Model Name	Version 3.0, Model Flex
Weight	1.6 lbs (0.7 kg)
S-Mount C-Clamp	0.5 in. (13 mm) to 2.5 in. (64 mm)
S-Mount Super Clamp	Max 1.3 in. (32 mm) flat surface; 0.5 in. (13 mm) to 2.1 in. (53 mm) round surface
S-Mount Maximum Extension	Vertical: 19.6 in. (49.8 cm) Horizontal: 25.6 in. (65 cm)
Power Supply	Class II, AC Power Adapter Input: 100-240VAC, 0.6A, 50/60Hz
Battery Charger	Input: 9 -12VDC, 2A
Battery	2 cell Lithium Ion Rechargeable Battery - Each battery stores <100Wh of energy
IR Wavelength, peak	Approximately 850 nm
Visible Wavelength, peak	Approximately 530 nm
Ratings	9V DC, 1.1A Maximum
Duty Cycle	Continuous
Operating Temperature	+60°F to +95°F (+16°C to +35°C)
Storage Temperature	-10°F to +140°F (-23°C to +60°C)
Storage Humidity	0% to 90% non-condensing
Atmospheric Pressure (storage and operating)	700 hPa – 1,060 hPa
Operating Humidity	10% to 90% non-condensing
Support	Christie Technical Support
Safety	VeinViewer Flex has been tested and complies with General Requirements for Safety per IEC 60601-1.
Emission	VeinViewer Flex has been tested to and complies with IEC60601-1-2 standard for Electromagnetic Compatibility (EMC) and for radiated and conducted emissions.
EMC Classified	B
Regulatory Classified	FDA Class 1 Exempt
Applied Parts	No applied parts – any contact with the equipment is incidental.

EQUIPMENT CLASSIFICATION

- INTERNALLY POWERED MEDICAL EQUIPMENT, WITH NO APPLIED PART.
- Protection Against Ingress of Liquids - Ordinary.
- Equipment is not suitable for use in the presence of flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Mode of operation of equipment - Continuous Operation.

VeinViewer Flex is manufactured and sold under U.S. patent 5,969,754 and 7,239,909.

FEDERAL (USA) law restricts this device to sale by, or on the order of, a physician/health-care professional.

Guidance and manufacturer's declaration - electromagnetic emissions		
VeinViewer Flex is intended for use in the electromagnetic environment specified below. The customer or the user of VeinViewer Flex should ensure that it is used in such an environment.		
Emission Test	**Compliance**	**Electromagnetic Environment - guidance**
RF emissions Cispr 11	Group 1	VeinViewer Flex uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions Cispr 11	Class B	VeinViewer Flex is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuation/flicker Emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity			
VeinViewer Flex is intended for use in the electromagnetic environment specified below. The customer or the user of VeinViewer Flex should ensure that it is used in such an environment.			
Immunity Test	**Test Level IEC 60601-1-2**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	The floor should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical Fast Transient/Burst IEC 61000-4-4	±2 kV Power Supply Lines ±1 kV input/output lines	±2 kV Power Supply Lines Not Applicable	MAINS power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line to line ±2 kV line to earth	±1 kV differential mode Not Applicable	MAINS power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions, and voltage variations on power IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (>60% dip in U_T) for 5 cycles 70% U_T (>30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5s	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (>60% dip in U_T) for 5 cycles 70% U_T (>30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5s	MAINS power quality should be that of a typical commercial or hospital environment. If the user of VeinViewer Flex requires continued operation during power MAINS interruptions, it is recommended that the VeinViewer Flex be powered from an uninterruptible power supply (UPS) or a battery.

Guidance and manufacturer's declaration – electromagnetic immunity (CONTINUED)			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Voltage dips, short interruptions, and voltage variations on power IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (>60% dip in U_T) for 5 cycles 70% U_T (>30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5s	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (>60% dip in U_T) for 5 cycles 70% U_T (>30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5s	MAINS power quality should be that of a typical commercial or hospital environment. If the user of VeinViewer Flex requires continued operation during power MAINS interruptions, it is recommended that the VeinViewer Flex be powered from an uninterruptible power supply (UPS) or a battery.
Magnetic field of power frequency IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the AC MAINS voltage prior to application of the test level.			

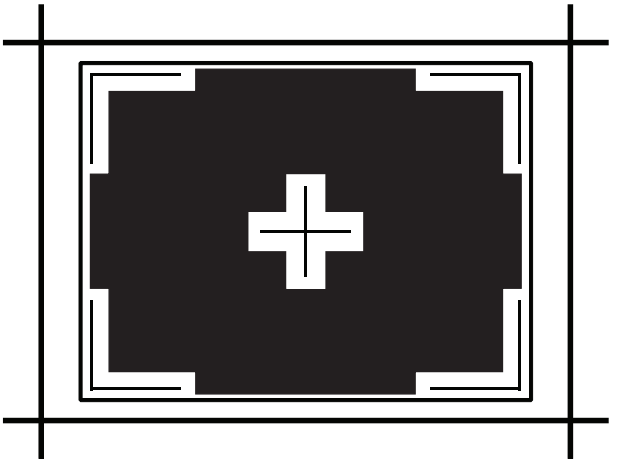
Guidance and manufacturer's declaration – electromagnetic immunity (CONTINUED)			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Conducted RF IEC 61000-4-6	3 Vrms from 150 kHz to 80 MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of VeinViewer Flex, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d=1.2 \times \sqrt{P}$ from 150 kHz to 80 MHz
Radiated RF IEC 61000-4-3	3 V/m from 80 MHz to 2.5 GHz	3 V/m	$d=1.2 \times \sqrt{P}$ from 80 MHz to 800 MHz $d=2.3 \times \sqrt{P}$ from 800 MHz to 2.5 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b]. Interference may occur in the vicinity of equipment marked with this symbol.

Guidance and manufacturer's declaration – electromagnetic immunity (CONTINUED)			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
NOTE 1: At 80MHz and 800MHz, the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radios, AM and FM radio broadcast, and TV broadcasts cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location that VeinViewer Flex is used exceeds the applicable RF compliance level on preceding pages, VeinViewer Flex should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating VeinViewer Flex. [b] Over the frequency range 150kHz to 80MHz, field strengths should be less than 3 V/m.			

Recommended separation distances between portable and mobile RF communications equipment and VeinViewer Flex			
VeinViewer Flex is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of VeinViewer Flex can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and VeinViewer Flex, as recommended below, according to the maximum output power of the communications equipment.			
Rated Maximum Output Power of Transmitter (W)	**Separation Distance According to Frequency of Transmitter (m)**		
	from 150 kHz to 80 MHz d=1.2 x √P	**from 80 MHz to 800 MHz d=1.2 x √P**	**from 800 MHz to 2.5 GHz d=2.3 x √P**
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed on the preceding page, the recommended separation distance d in meters (m) can be estimated, using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W), according to the transmitter manufacturer. NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			

Contact Christie Medical Holdings, Inc. for Standard Limited Warranty and Terms and Conditions.

This page has been left intentionally blank.



CE 0123

EC REP

Emergo Europe
Molenstraat 15
2513 BH, The Hague
The Netherlands

Illuminating revolutionary patient care.™

CHRISTIE+

Christie | 3175 Lenox Park Boulevard, Suite 200 | Memphis, TN 38115 | USA

©2011-2015 Christie Medical Holdings, Inc.

020-300020-07 Rev. 1 10-2015